UNITED STATES PATENT AND TRADEMARK OFFICE
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CATEGORY:

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Transmittal Letter to the United States Designated/Elected Office (DO/EO/US)

FORM PTO-1390

09/623584

cation No.	:
onal Application No.	: **PCT/EP99/01221**
onal Filing Date.	: **FEBRUARY 25, 1999**
Date Claimed	: March 9, 1998
Invention	: **HIGH-SPEED SHEARS FOR CUTTING ROLLED STRIP TO LENGTH**
nt(s) for (DO/EO/US)	: **Horst Grafe, Matthias Beuter, Karl-Friedrich Fuhrmann and Erich Münker**

cant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

X This is a **FIRST** submission of items concerning a filing under 35 U.S C. 371.

___ This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U S.C. 371.

X This express request to begin national examination procedures 35 U.S.C 371 (f) at any time rather than delay examination until the expiration of the applicable time limit set forth in 35 U.S C 371(b) and PCT Articles 22 and 39(1).

___ A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date

___ A copy of the International Application as filed [35 U S.C. 371(c)(2)],

a) ___ is transmitted herewith (required only if not transmitted by the International Bureau).

b) ___ has been transmitted by the international Bureau.

c) ___ is not required, as the application was filed in the United States Receiving Office (RO/US)

X A translation of the International Application into English [35 U.S.C.371(c)(2)]

___ Amendments to the claims of the International Application under PCT Article 19 [35 U S.C.371(c)(3)].

a) ___ are transmitted herewith (required only if not transmitted by the International Bureau)

b) ___ have been transmitted by the International Bureau.

c) ___ have not been made; however, the time limit for making such amendments has **NOT** expired

d) ___ have not been made and will not be made.

___ A translation of the amendments to the claims under PCT Article 19 [35 U S.C.371(c)(3)].

X An oath or declaration of the inventor(s) [35 U S.C 371(c)(4)]. **UNSIGNED**

___ A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 [35 U S.C 371(c)(5)]

Items 11. to 16. below concern other document(s) or information included:

___ An Information Disclosure Statement under 37 C F.R 1.97 and 198.

___ An Assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included

X A **FIRST** preliminary amendment

___ A **SECOND** or **SUBSEQUENT** preliminary amendment.

___ A substitute specification.

___ A change of power of attorney and/or address letter.

X (other items or information) **Three sheets of drawings**

EXPRESS MAIL No **EL 599 502 874 US** Deposited: **August 31, 2000**

I hereby certify that this correspondence is being deposited with the United States Postal Service Express mail under 37 CFR 1 10 on the date indicated above and is addressed to the Commissioner of Patents and Trademarks, Washington, DC 20231.

Friedrich Kueffner

August 31, 2000
Date

17. X The following fees are submitted:

	CALCULATIONS	PTO USE ONLY
BASIC NATIONAL FEE [37 CFR 1.492(a)(1)-(5)]:		
X Search Report has been prepared by the EPO or JPO..... $ 840.00		
___ International preliminary examination fee paid to USPTO [37 CFR 1.482]... $ 670.00		
___ No International preliminary examination fee paid to USPTO [37 CFR 1 482] but International search fee paid to USPTO [37CFR 1 445(a)(2):. $ 690.00		
___ Neither International preliminary examination fee [37 CFR 1 482] nor International search fee [37 CFR 1.445(a)(2]) paid to USPTO: $ 970.00		
___ International preliminary examination fee paid to USPTO [37 CFR 1 482] and all claims satisfied provisions of PCT Article 33 (2) to (4). $ 96.00		
ENTER APPROPRIATE BASIC FEE AMOUNT:	$ 840.00	
Surcharge of $ 130.00 for furnishing the oath or declaration later than ___20 ___30 months from the earliest claimed priority date [37 CFR 1.492(e)]	$ 840.00	
Claims filed: Total Claims 13 -20= x $ 18.= $; Indep. Claims 2 - 3= x $ 78.= $; Multiple Dependent Claims (if applicable) + $ 260.= $		
TOTAL OF ABOVE CALCULATIONS:	$ 840.00	
Reduction by ½ for filing by small entity, if applicable. Verified Small Entity Statement must be filed also. [Note 37 CFR 1 9,1.27, 1 28] (divided by 2)		
SUBTOTAL:	$ 840.00	
Processing fee of $ 130 00 for furnishing the English translation later than ___20 ___30 months from the earliest claimed priority date [37 CFR 1.492(f)]	$	
TOTAL NATIONAL FEE:	$ 840.00	
Fee for recording the enclosed assignment [37 CFR 1 21(h)] The assignment must be accompanied by an appropriate cover sheet [37 CFR 3.28,3.31]. $ 40.00 per property	$	
TOTAL FEES ENCLOSED:	$ 840.00	
AMOUNT TO BE REFUNDED:	Refunded	$
AMOUNT TO BE CHARGED:	Charged	$

a) X A check in the amount of **$ 840.00** to cover the above fees is enclosed

b) _ Please charge my Deposit Account No. 11-1835 in the amount of $ to cover the above fees
A duplicate copy of this sheet is enclosed.

c) X The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. **11-1835**. A duplicate copy of this sheet is enclosed

NOTE: Where an appropriate time limit under 36 CFR 1.494 or 1.495 has not been met, a petition to revive [37 CFR 1 137(a) or (b)] must be filed and granted to restore the application to pending status.

SEND ALL CORRESPONDENCE TO: Friedrich Kueffner
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Friedrich Kueffner
Name

signature

29,482
Reg. No.

August 31, 2000
Date

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

HM-349PCT

Applicant	:	Horst Grafe, et al
Serial No.	:	not known (PCT/EP99/01221)
Int. Filed	:	FEBRUARY 25, 1999
For	:	HIGH-SPEED SHEARS FOR CUTTING ROLLED STRIP TO LENGTH

Assistant Commissioner for Patents
Washington, D.C. 20231

PRELIMINARY AMENDMENT

S I R:

In advance of the first office action, please amend the claims as follows:

IN THE CLAIMS

Claim 1, line 7, change "characterized in that" to --wherein--.

Claim 2, line 2, change "characterized in that" to --wherein--.

Claim 3, line 1, change "one of claims 1 or 2," to --claim 1,--;
line 2, change "characterized in that" to --wherein--.

Claim 4, line 1, change "one of claims 1 or 2," to --claim 1,--;
line 2, change "characterized in that" to --wherein--.

Claim 5, line 1, change "one of claims 1 through 4," to --claim 1,--;
line 2, change "characterized in that" to --wherein--.

Claim 6, line 1, change "one of claims 1 through 5," to --claim 1,--;
line 2, change "characterized in that" to --wherein--.

Claim 7, line 1, change "one of claims 1 through 6," to --claim 1,--;
line 2, change "characterized in that" to --wherein--.

Claim 8, line 7, change "characterized in that" to --wherein--.

Claim 9, line 2, change "characterized in that" to --wherein--.

Claim 10, line 1, change "claims 8 or claim 9," to --claim 8,--;
line 2, change "characterized in that" to --wherein--.

Claim 11, line 1, change "one of claims 8 through 10," to --claim 8,--;
line 2, change "characterized in that" to --wherein--.

Claim 12, line 1, change "one of claims 8 through 11," to --claim 8,--;
line 2, change "characterized in that" to --wherein--.

Claim 13, line 1, change "one of claims 1 through 12," to --claim 1,--;
line 2, change "characterized in that" to --wherein--.

REMARKS

Claims 1 - 13 are in the application.

As a result of the foregoing amendment, the claims have been amended to remove improper claim language.

Any additional fees or charges required at this time in connection with the application may be charged to our Patent and Trademark Office Deposit Account No. 11-1835.

Respectfully submitted,

Friedrich Kueffner
Reg. No. 29,482

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August 31, 2000
342 Madison Avenue
New York, NY 10173
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EXPRESS MAIL No.: **EL 599 502 874 US** Deposited: **August 31, 2000**

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Friedrich Kueffner

High-speed shears for cutting rolled strip to length

The invention relates to flying shears with cutting tools located on drums facing each other, which tools are accelerable by at least one driving device assigned to them to a peripheral speed corresponding to the speed of the strip to be cut and with separately controllable adjusting device assigned to one of the drums.

Similar shears have become known through DE-OS 21 38 478. These shears are, however, intended for the cutting of fast-running wire. For the cutting of strips, DE-OS 41 28 970 discloses linear guides for the drums, which guides are located in stands. In this case, blades are used, which require very exact synchronization between drum drive and adjusting drive in order to be able to execute a correspondingly clean cut. Through this very exact synchronization, such shears are relatively slow.

The invention is based on the object of further developing flying shears for the cutting of hot strip in such a way that good cutting results are guaranteed even at strip speeds of up to 30 m/sec and with minimal strip thicknesses.

For the solving of this object it is proposed that one of the drums is mounted on rockers, that the adjusting device consists of drives effecting the cutting movement and support elements located between said drives and the rockers and that the support elements are shortenable to an effective position effecting a cut. A further solution

proposal consists in that one of the drums is mounted on rockers, that the rockers are supported by means of support elements, that the support elements are shortenable to an effective position effecting a cut, that the adjusting device has cranks which are connected with the second drum, and said second drum is capable of leading to the cut through paraxial displacement towards the first drum.

Through this design of the shears it is achieved that the drums can always be driven at a peripheral speed corresponding to the speed of the strip to be cut or at a peripheral speed slightly lowered in comparison with said speed respectively. Thereby the cutting tools can always execute the cutting movement without a cut being made. Only when a cut is to be executed are the support elements brought into effective position. The next cutting movement of the cutting tools then leads to the cut.

There is also the possibility to leave only the drums constantly at a corresponding peripheral speed and to drive the adjusting device only for a cut.

Alternatively the driving device for the drums can naturally also be brought to a standstill during the times in which no cut is to be made. In order to accelerate these drums for the cut, however, substantially greater motor outputs are required than if the drums were to run constantly at a corresponding peripheral speed.

It is of advantage if the support elements are lockable in their effective length. By this means it is achieved that a spring-back between the drums is limited to a minimum so that cuts as exact as possible can be made. With corresponding dimensioning of the support elements, the power transmission can be effected directly by them, i.e. without corresponding locking.

Through the use of chisel and anvil as cutting tools, a very exact synchronization, as is required with cutting blades, is not necessary. Nonetheless, a synchronization between the driving devices and the drives or cranks respectively is appropriate, whereby, however, slight

slips can be compensated through the fact that larger jacket areas act as an anvil.

It is advisable to bring the support elements into their effective position before the beginning of the working stroke of the drives or cranks respectively. By this means it is guaranteed that the support elements are already in effective position during the cut and irregularities cannot occur through adjustments of the support elements during the cut.

In the case of the very thin hot strips to be cut here, it has been shown that the strip starts are very difficult to guide after a cut. It is therefore of great importance to integrate the cutting devices into a corresponding coiler or to place said cutting devices at a minimum distance in front of the coiler respectively.

The invention is explained in greater detail by means of a drawing in which

Figure 1 shows in schematic representation shears according to the invention,

Figure 2 shows a further solution compared with Fig. 1 for the adjusting drive,

Figure 3 shows the schematic representation of further shears according to the invention, and

Figure 4 shows shears according to the invention integrated into a coiler.

Figure 1 shows shears 1 which have a drum 2 and a drum 3. The drum 3 is carried by a rocker 4. One arm of the rocker 4 is mounted pivotably around the pivot point 5. The drum 2 has a chisel 6, whereas the drum 3 is equipped with an anvil 7. The drums 2 and 3 are rotary-driven by driving devices 8 to a peripheral speed corresponding to the speed of the running strip 9. Thereby a mechanical or electrical or electronic synchronization respectively is provided between the drives 8 and thus

between the drums 2 and 3. At the second end of the rocker 4, a support element 10 is located, which support element is adjustable in its length and consists essentially of a piston-cylinder unit 11. The support element 10 is linked to a crank 12 which is acted upon by a drive 13.

The function of the shears 1 is as follows: The drums 2 and 3 are kept constantly at a corresponding peripheral speed or brought before a cut to the necessary peripheral speed respectively by the drives 8. The crank 12 is likewise constantly driven or brought before a cut to the corresponding rotational speed respectively. Thereby the ratio of the peripheral speeds between the drum 2 and the crank 12 can be set, for example to 1:8. A possible synchronization between the drum 2 and the crank 12 is indicated by the line 14 or the line 14' respectively. Through the rotary movement of the crank 12, the crank 3 is moved constantly to and fro along the arrow 15. If this adjusting movement is to lead to the cut, the piston-cylinder unit 11 is driven together before the crank reaches the lower dead point and arrested if applicable. By this means the drum 3 is pivoted to a substantially reduced distance from the drum 2. On the next reaching of the lower dead point of the crank 12, the corresponding cut is then executed. Through the synchronization between the crank 12 and the drum 2 it is achieved that, when the crank 12 is positioned at the lower dead point, the chisel 6 is facing the anvil 7, so that the strip 9 can be separated.

Figure 2 shows that, instead of the adjusting drive consisting of the crank 12, the drive 13 and the support element 10, a piston-cylinder unit 16 can be used, whereby this piston-cylinder unit has two separately pressurizable pistons. The upper piston corresponds to that of the piston-cylinder unit 11, whereas the lower piston replaces the crank 12 and the drive 13.

Figure 3 shows shears 1' which consist of the drums 2' and 3', whereby the drum 3' is held on the rocker 4'. The drum 2' is eccentrically mounted by means of a crank 12'. By means of an arresting device 17, the rocker 4' can be locked in the lower position of the piston of the piston-cylinder unit 11'. The function of the shears 1' is as follows: The drums 2' and 3' are constantly driven or accelerated before a cut to a corresponding

peripheral speed respectively by the motor 8'. The same applies to the crank 12', which is acted upon by the drive 13'. By this means the drum 2' executes, besides the circular movement effected by the driving device 8', a superimposed stroke movement effected by the crank 12'. If the strip 9' is to be cut, the piston-cylinder unit 11', before the chisel 6' reaches its upper point in the drawing, is retracted and blocked by the arresting device 17. By this means the distance between the drums 2' and 3' is so strongly reduced that the strip 9' is separated by the chisel 6' on the next reaching of the upper dead point.

Figure 4 shows a reverse coiler 18, whereby the strip 9 is led over a guide pulley 19 to the coiler 20. If the coiler 20 has the given number of windings and the strip 9 is to be cut, the drum 2'' is pivoted against the coiler 21, whereby the pivoting movement can be executed as specified with respect to Fig. 1 or Fig. 3. The coiler 21 acts as the corresponding anvil. After the executed cut, the strip 9 can be coiled immediately onto the coiler 21.

Survey of reference numbers

1	Shears
2	Drum
3	Drum
4	Rocker
5	Pivot point
6	Chisel
7	Anvil
8	Driving device
9	Strip
10	Support element
11	Piston-cylinder unit
12	Crank
13	Drive
14	Line
15	Arrow
16	Piston-cylinder unit
17	Arresting device
18	Reverse coiler
19	Guide pulley
20	Coiler
21	Coiler

Patent claims

1. Flying shears (1) with cutting tools (6, 7) located on drums (2, 3) facing each other, which tools are accelerable by at least one driving device (8) assigned to them to a peripheral speed corresponding to the speed of the strip (9) to be cut and with separately controllable adjusting device assigned to one of the drums mounted on rockers (4),
characterized in that
one of the drums (3) is mounted on rockers (4), that the adjusting device consists of drives (12, 13) effecting the cutting movement and support elements (10) located between said drives and the rockers (4) and that the support elements (10) are shortenable to an effective position effecting a cut.

2. Flying shears according to claim 1,
characterized in that
the support elements (10) are lockable in their effective length.

3. Flying shears according to one of claims 1 or 2,
characterized in that
the drive is configured as a crank (12).

4. Flying shears according to one of claims 1 or 2,
characterized in that
the drive is configured as a piston-cylinder unit (16).

5. Flying shears according to one of claims 1 through 4,
characterized in that
a synchronization (14, 14') is provided between the driving devices (8) and the drives (12, 13).

6. Flying shears according to one of claims 1 through 5,
characterized in that
the cutting tools (6, 7) are configured as a chisel (6) located on a drum (2) and as a jacket area acting as an anvil (7) located on the second drum (3).

7. Flying shears according to one of claims 1 through 6,
characterized in that
the support elements (10) are bringable into their effective position before the beginning of the working stroke of the drives (12, 13).

8. Flying shears (1') with cutting tools (6', 7') located on drums (2', 3') facing each other, which tools are accelerable by at least one driving device (8') assigned to them to a peripheral speed corresponding to the speed of the strip (9') to be cut and with separately controllable adjusting device assigned to one of the drums (2'),
characterized in that
one of the drums (3') is mounted on rockers (4'), that the rockers (4') are supported by means of support elements (10'), that the support elements (10') are shortenable to an effective position effecting a cut, that the adjusting device has cranks (12') which are connected with the second drum (2'), and said second drum is capable of leading to the cut through paraxial displacement towards the first drum (3').

9. Flying shears according to claim 8,
characterized in that
the support elements (10') are lockable in their effective length.

10. Flying shears according to claims 8 or claim 9,
characterized in that
a synchronization is provided between the driving devices (8') and the cranks (12').

11. Flying shears according to one of claims 8 through 10,
characterized in that
the cutting tools (6', 7') are configured as a chisel (6') located on a drum (2') and as a jacket area acting as an anvil (7') located on the second drum (3').

12. Flying shears according to one of claims 8 through 11,
characterized in that
the support elements (10') are bringable into effective position before the beginning of the working stroke of the cranks (12').

13. Flying shears according to one of claims 1 through 12,
characterized in that
the shears (1, 1') are an integral part of a coiler (18-20).

HIGH-SPEED SHEARS FOR CUTTING ROLLED STRIP TO LENGTH

ABSTRACT

Flying shears for thin hot strip are to be configured in such a way that very fast running strip can be securely cut. For this purpose it is proposed that one of the cutting tool drums is mounted on a rocker, that an adjusting device consists of drives effecting the cutting movement and support elements located between said drives and the rockers and that the support elements are shortenable to an effective position effecting a cut.

FIG.1

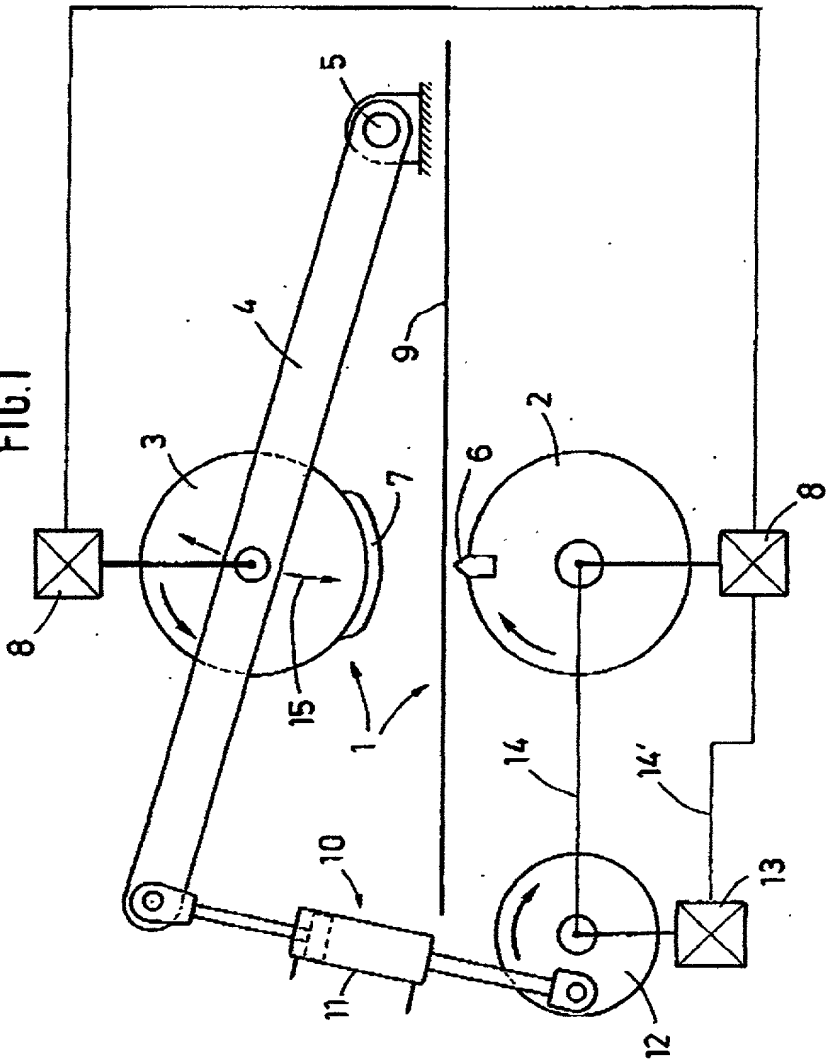
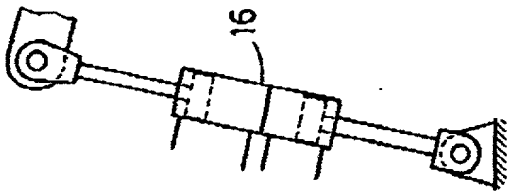


FIG.2



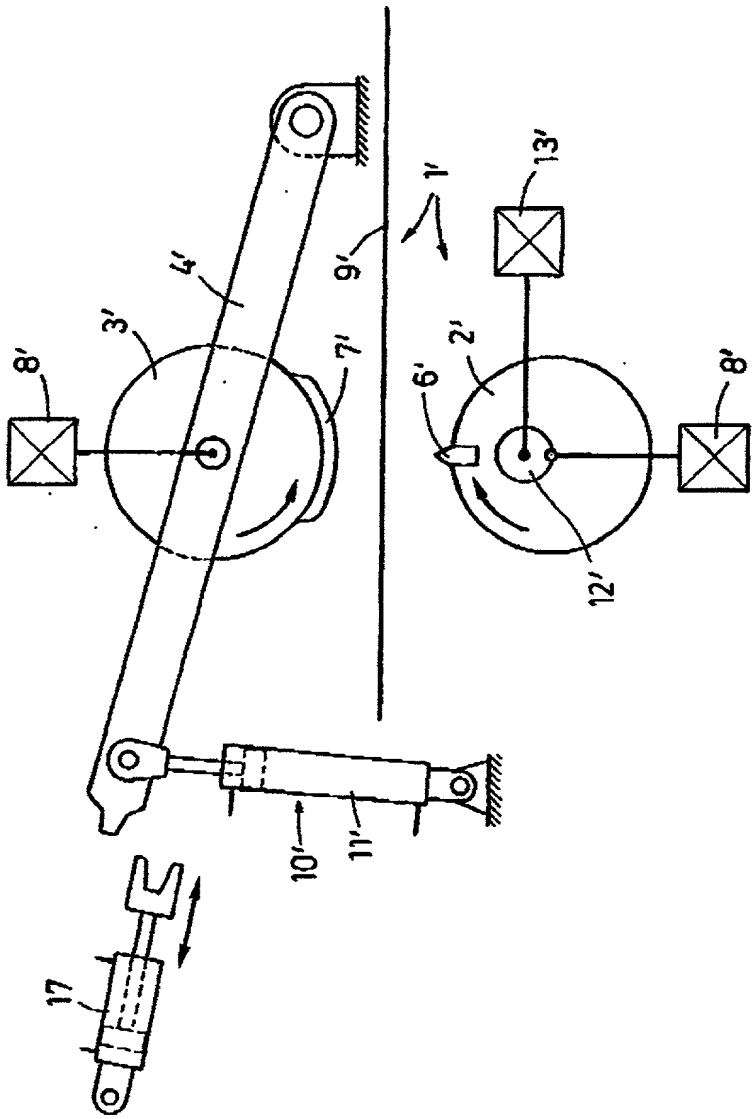


FIG. 3

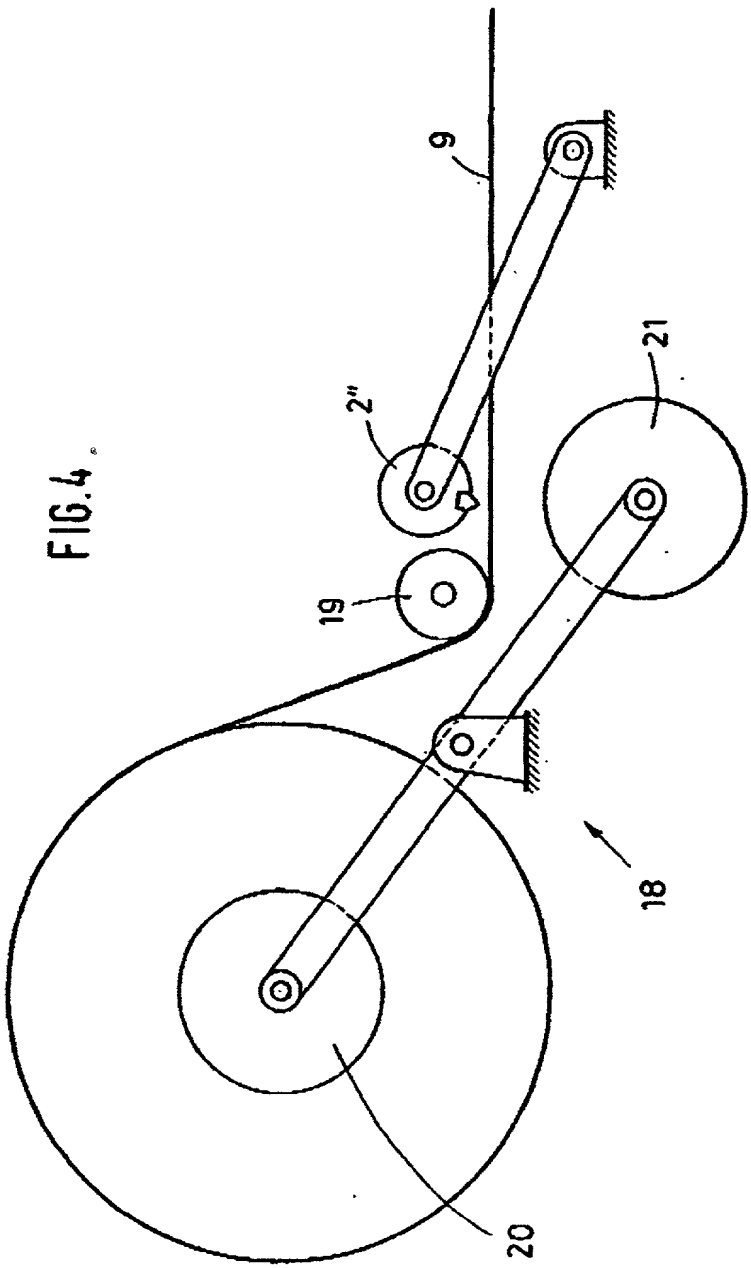


FIG.4.

3895

COMBINED DECLARATION FOR PARENT APPLICATION AND POWER OF ATTORNEY *(includes Reference to PCT International Applications)*	Attorney's Docket No. **HM-349**

As a below named inventor, I hereby declare that:
My residence, post office address and citizenship are as stated below next to my name,

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled: **HIGH-SPEED SHEARS FOR CUTTING ROLLED STRIP TO LENGTH**

the specification of which (check only one item below):

[ ] is attached hereto.

[ ] was filed as United States application

Serial No. _____
on _____,
and was amended
on _____ (if applicable).

[X] was filed as PCT international application

Number **PCT/EP99/01221**
on **FEBRUARY 25, 1999**,
and was amended under PCT Article 19
on _____ (if applicable).

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above. I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, §1.56(a).

I hereby claim foreign priority benefits under Title 35, United States Code, §119 of any foreign application(s) for patent or inventor's certificate or of any PCT international application(s) designating at least one country other than the United States of America listed below and have also identified below any foreign application(s) for patent or inventor's certificate or any PCT international application(s) designating at least one country other than the United States of America filed by me on the same subject matter having a filing date before that of the application(s) of which priority is claimed:

PRIOR FOREIGN/PCT APPLICATION(S) AND ANY PRIORITY CLAIMS UNDER 35 U.S.C. 119:

COUNTRY *(if PCT, indicate PCT)*	APPLICATION NUMBER	DATE OF FILING *(day, month, year)*	PRIORITY CLAIMED UNDER 35 USC 119
GERMANY	**198 09 813.8**	**9 MARCH 1998**	[X] YES [ ] NO
			[ ] YES [ ] NO

Combined Declaration For Parent Application and Power of Attorney (Continued) *(includes Reference to PCT International Applications)*	Docket No. **HM-349**

I hereby claim the benefit under Title 35, United States Code, §120 of any United States application(s) or PCT international application(s) designating the United States of America that is/are listed below and, insofar as the subject matter of each of the claims of the application is not disclosed in that/those prior application(s) in the manner provided by the first paragraph of Title 35, United States Code, §112, I acknowledge the duty of disclose material information as defined in Title 37, Code of Federal Regulations, §1.56(a) which occured between the filing date of the prior application(s) and the national or PCT internation filing date of this application:

PRIOR U.S. APPLICATIONS OR PCT INTERNATIONAL APPLICATIONS DESIGNATING THE U.S. FOR BENEFIT UNDER 35 U.S.C. 120:

U.S. APPLICATIONS		**STATUS *(CHECK ONE)***		
U.S. APPLICATION NUMBER	U.S. FILING DATE	PATENTED	PENDING	ABANDONED
PCT APPLICATIONS DESIGNATING THE U.S.				
PCT APPLICATION NO.	PCT FILING DATE	U.S. SERIAL NO.		

POWER OF ATTORNEY: As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith. *(List name and registration number)*

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Combined Declaration For Parent Application and Power of Attorney (Continued) *(includes Reference to PCT International Applications)*				Docket No. HM-349
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2	FULL NAME OF INVENTOR	*Family Name* **Fuhrmann**	*First Given Name* **Karl-Friedrich**	*Second Given Name*
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Combined Declaration For Parent Application and Power of Attorney (Continued) *(includes Reference to PCT International Applications)*	Docket No. **HM-349**

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

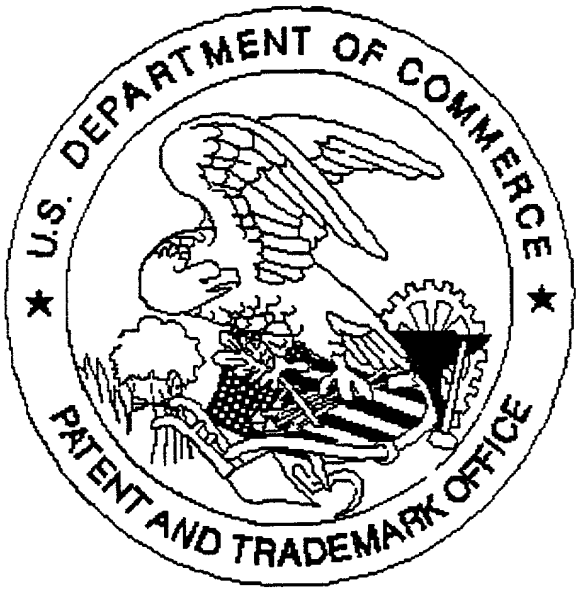
SIGNATURE OF INVENTOR 201	*SIGNATURE OF INVENTOR 202*	*SIGNATURE OF INVENTOR 203*
X	X	X
DATE X 20.9.00	*DATE* X 15.09.00	*DATE* X 20.09.00
SIGNATURE OF INVENTOR 204	*SIGNATURE OF INVENTOR 205*	*SIGNATURE OF INVENTOR 206*
X		
DATE X 21.09.2000	*DATE*	*DATE*

PTO-1391 (REV. 10-83)

U.S. DEPARTMENT OF COMMERCE - Patent and Trademark Office

United States Patent & Trademark Office

Office of Initial Patent Examination -- Scanning Division



Application deficiencies found during scanning:

☐ Page(s)_____of_____ were not present for scanning. (Document title)

☐ Page(s)_____of_____were not present for scanning. (Document title)

There were three sheets of drawing.

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